

THREE NEW SPECIES OF *TRIUMFETTA* FROM WESTERN MEXICO

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The American species of *Triumfetta* (Tiliaceae) were revised more than a quarter-century ago by Ko Ko Lay (Ann. Missouri Botanical Garden 37: 315–395. 1950). He recognized 43 American species, about half of which were known from the Pacific slope of Mexico from Guerrero westward and northwestward. The material available to him from that part of Mexico was rather scanty, but in the intervening years botanical exploration has been proceeding rapidly, and it is not surprising that we now have material representing three distinctive species that appear to be undescribed. Two of these species are from the mountains of Jalisco, from areas very little explored before 1950, and the third is from the coastal lowlands of southern Nayarit and adjacent Jalisco, areas inadequately explored even today. All three species have the arcuately recurved (uncinate) hyaline spinules of ovaries and fruits, that characterize the Series *Uncinatae* as understood by Ko Ko Lay. We do not feel that this one feature affords a valid taxonomic separation from the members of the genus in which the spinules are straight or only slightly deflexed. A number of species-pairs with different types of spinules appear to be related in other ways, and we suspect that over-emphasis upon the spinule character may obscure the true relationships in the genus. A complete analysis of this is outside the scope of this paper.

Two of the new species described below have flowers that are large for the genus (sepals mostly 3.5–4.5 cm long, combined with petals 7.5–8 mm long), and the third is unique in having the vegetative parts pilose with long simple hairs, and in the very long (5–6.5 mm) sterile tips of the sepals. The following key should serve to separate the new taxa from others already known from the same general area on the Pacific slope of Mexico:

1. Petals and sepals both more than 2.5 cm long; spines of the fruit commonly 200 or more, 5–10 mm long, plumose; petioles ca 1 cm long or less. *T. polyandra* DC.
1. Petals 2.5 cm long or less, the sepals sometimes longer; spines up to 100, seldom more, 5 mm long or less (usually much less), never long and plumose; petioles various.
 2. Sepals on open flowers 4–4.5 cm long; petals 7.5–8 mm long; fruit densely gray-pubescent, the spines ca 35–100, uncinata, 1–2 (–4) mm long, 0.5–1 mm thick at base; herbage minutely stellate, the leaves essentially glabrous except for long hairs in the vein axils.
 3. Inflorescence and mature buds nearly glabrous, with small sausage-shaped to cylindrical glandular trichomes; petioles glabrous; spines of the fruit ca 100. *T. gonophora*, sp. nov.
 3. Inflorescence evidently stellate-pubescent, the buds densely so, the glands visible among the hairs; petioles stellate-pubescent; spines of the fruit 35–50. *T. indurata*, sp. nov.
 2. Sepals 2.5 (–2.9) cm long or less, if more than 2 cm long the petals ca 1.5 cm long or more; fruit glabrous or glandular, seldom (?never) densely pubescent, the spines elongate, seldom (?never) much thickened at base; leaves various.
 4. Sterile tips (“appendages”) of the sepals 5–6.5 mm long; calyx glabrous; herbage copiously pilose with simple hairs 2–5 mm long; spines of the fruit 100–130, 2–4.5 mm long, uncinata, stiffly retrorsely hispid. *T. medusae*, sp. nov.

4. Appendages 3 mm long or usually less; calyx mostly (?always) stellate-pubescent; herbage glabrous to coarsely stellate-pubescent; spines various.
5. Petioles with 2–4 prominent spherical glands at the summit; sepals 2.2–2.9 cm long at anthesis; petals 2–2.3 cm long; fruit unknown; spinules of the ovary straight or deflexed, not uncinata; petioles 1.5 cm long; leaves elliptical, acute; stamens 20. *T. cucullata* Fern.
5. Petioles without glands at the summit, the lower foliar teeth sometimes much thickened and enlarged; sepals shorter, if 2 cm long or more, then evidently longer than the petals; leaves and petiole-length various.
6. Petals 1.2–1.8 cm long; sepals at anthesis 1.8–2.5 cm long; stamens 20 (–25 in one species).
7. Leaves obtuse or short-pointed, as wide as long or up to 1.5 times longer than wide, pale and stellate-tomentose beneath, or the hairs merely intricately overlapping, with branches 1 mm long; spines uncinata. *T. discolor* Rose
7. Leaves caudate-acuminate, at least those in the inflorescence about twice as long as wide, nearly glabrous to thinly stellate-pubescent beneath, the branches of the hairs mostly less than 1 mm long.
8. Leaves below the inflorescence up to 6–12 cm wide, on petioles 5–11 cm long; axils of the basal and lateral veins on the lower leaf-surface conspicuously bearded, the surface itself minutely stellate-puberulent on the veins, otherwise glabrous; fruits and bases of spines loosely short-pilose; spines with uncinata tips. *T. barbosa* Ko Ko Lay
8. Leaves below the inflorescence 2–4 cm wide, on petioles 1–2.5 cm long; axils of the lateral veins not bearded, the basal somewhat so; fruits puberulent or pubescent to nearly glabrous.
9. Spines of the fruit with straight or slightly deflexed hyaline tips; fruit 4-locular; leaves appearing subglabrous, thinly stellate-puberulent and bearded in the basal axils beneath, commonly with few or no large stellate hairs, and few long simple hairs. *T. goldmanii* Rose
9. Spines with uncinata hyaline tips; fruit 3-locular; lower leaf-surface commonly loosely and conspicuously, rather coarsely pilose with stellate and simple hairs intermingled. *T. columnaris* Hochr.
6. Petals 1 cm long or less; sepals at anthesis 1.3 cm long or less (if 1.3–1.6 cm long, the longer petioles only 1–1.5 cm long); stamens 20–40.

[Extralimital species].

***Triumfetta gonophora* W. W. Thomas & McVaugh, sp. nov.**

Fig. 1, h–n.

Arbor 4 m alta, 10 cm diametro, glabra; folia ovata, supra glabra, subtus venarum axillis basium pilis caespitosis 1 mm longis instructa, basi rotundata, apice attenuata subcaudata, marginibus serratis; venatio palmata, venis majoribus 3–5; petioli tenues 2.5–5 cm longi; stipulae deciduae subulatae 4–5 mm longae; inflorescentia terminalis et axillaris, ramis 10–25-floris; pedicelli 8–10 mm longi, fructiferi 10–13 mm; gemma anthesis initio anguste ovoidea, 2.5–3.3 cm longa; sepala lanceolata attenuata 4.1–4.5 cm longa, 5–6 mm lata, appendicibus 1.5–2 mm longis; petala sublinearia 8 mm longa, 1 mm lata basi pilosa; gonophorum cylindricum, glandulis oblongis 1.3–1.5 mm longis basi acutis praeditum; urceolus subrigidus glaber, patens, lobulatus; stamina ca 20, glabra, 3–4 cm longa; antherae (1.5–) 1.9–2 mm longae; styli 3.5–4 cm longi; ovarium orbiculare, ad 2 mm diametro, uncinato-spinulosum; fructus (immaturus) orbicularis, 4-locularis, 6–8 mm diametro, spinis 100–120, spinulis inflexis, arcuatis.

Essentially glabrous, the stems and petioles reddish, the flowers bright yellow; leaves 7.5–11 cm long, 3–4.5 cm wide, ca 2.5 times as long as wide; marginal serrations shallow, 0.5–1.5 mm wide, the basal teeth bearing apical glands ca 0.5 mm in diameter, the surfaces with scattered red glands; flowers mostly in terminal 2–3-flowered cymes that are repeatedly surpassed by the axillary branches of the

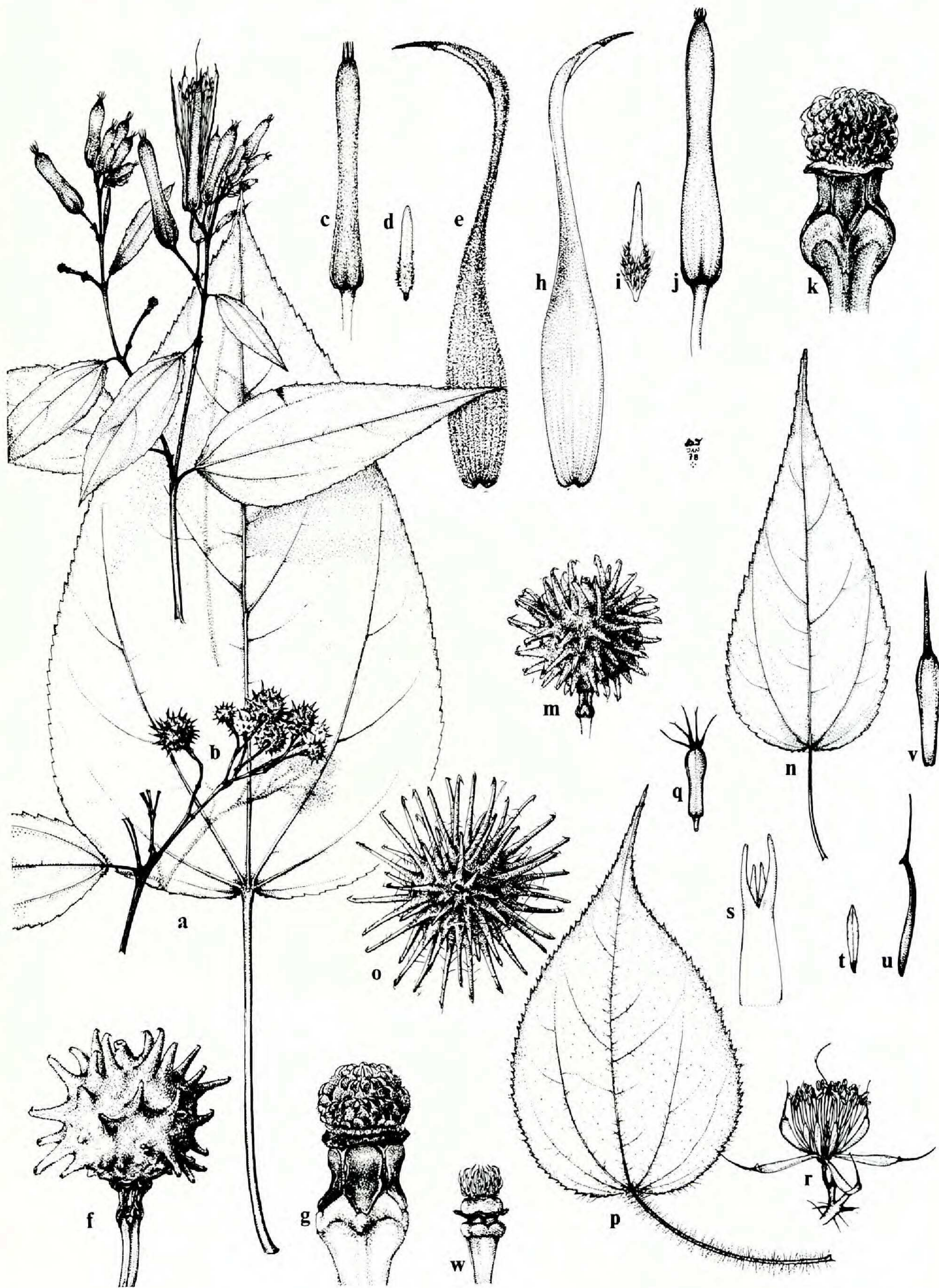


FIG. 1. *Triumfetta*. a-g, *T. indurata*; a, b, f, g, from the type, c-e from *McVaugh 21302*. a, leaf, and flowering twig $\times 0.5$; b, fruiting twig $\times 0.5$; c, bud $\times 1$; d, petal $\times 1.5$; e, sepal $\times 2$; f, fruit $\times 2$; g, ovary and gonophore $\times 5$. h-n, *T. gonophora*, from the type. h, sepal $\times 2$; i, petal $\times 2$; j, bud $\times 1$; k, ovary and gonophore $\times 5$; m, fruit $\times 2$; n, leaf $\times 0.5$. o-w, *T. medusae*; o from *Anderson & Anderson 6024*, p-w from the type. o, fruit $\times 2$; p, leaf $\times 0.5$; q, bud $\times 1$; r, flower $\times 1$; s, style-tip $\times 25$; t, petal $\times 1.5$; u, v, lateral and adaxial views of sepal $\times 1.5$; w, ovary and gonophore $\times 5$. Drawings by Karin Douthit.

inflorescence; bracts leaflike, greatly reduced; sepals fused at base, somewhat stellate-pubescent especially near the margins on the inner surface; ovary and fruit, including spines, hispid with stellate hairs in part, these matted between the spines; spines rigid, subulate, conic at base, 1.5–2.5 mm long.

Known only from the barranca-forests on the seaward-facing slopes of the Sierra de Manantlán, Jalisco, 30–35 km SE of Autlán, between El Chante and Cuzalapa, where it is abundant at elevations of 1500–1900 m, with *Podocarpus*, *Quercus*, *Ostrya*, *Matudaea*, and other deciduous trees, collected in flower 22–23 March, 1965 (*McVaugh 23229*, MICH, holotype).

This new species somewhat suggests in appearance other large-flowered species of western Mexico, e.g. *T. barbosa* and *T. columnaris*. From both it differs in having flowers almost twice as large, and sepals longer in proportion to the petals, as well as in having shorter and stouter spines. In *T. columnaris* the herbage is more or less scurfy-stellate, and in *T. barbosa* the urceolus is strongly ciliate.

***Triumfetta indurata* W. W. Thomas & McVaugh, sp. nov.**

Fig. 1, a–g.

Arbor 3–10 m alta, minute stellato-pubescent; folia ovata, supra subglabra, subtus sparce pubescens et venarum axillis basalium pilis simplicibus 1 mm longis instructa, basi rotundata vel subtruncata, apice acuminata, marginibus serratis, dentibus basalibus in glandulas cupuliformes sensim transeuntibus; venatio palmata, venis majoribus 3–5; petioli (3–) 5–10 cm longi densiuscule pubescentes; stipulae mox deciduae, subulatae, pubescentes, 4–8 mm longae; inflorescentia terminalis et axillaris, ramis 20–50-floris; pedicelli 6–7 mm longi; gemma anthesis initio 2.7–2.9 cm longa, anguste oblonga, dense pubescens vel etiam pilosa; sepala lanceolata attenuata 4–4.3 cm longa, 4 mm lata, appendicibus 3–4 mm longis; petala sublinearia 7.5–8 mm longa, 1 mm lata, basi pilosa; gonophorum cylindricum, glandulis oblongis 1.5–1.8 mm longis basi acutis praeditum; urceolus subrigidus glaber (vel sparce ciliatus), patens, lobulatus; stamina (20–) 30, ca 3 cm longa, glabra; antherae 1.3–1.8 mm longae (–2.1 mm longae humefactae); styli ad 4 cm longi; ovarium oblatum, ad 1.6 mm latum, uncinato-spinulosum; fructus lignosus, orbicularis vel oblatum, 4–5 (–6?)-ocularis, corpore 8–10 mm diametro, spinis 35–50, spinulis inflexis, arcuatis.

Herbage and inflorescence at least when young rather densely pubescent with minute stellate trichomes and beset with numerous minute elongate red glandular trichomes; stems and petioles often reddish, the flowers bright or light yellow; leaves mostly 10–20 cm long below the inflorescence, 5–10 cm wide, 1.8–2.5 times as long as wide; marginal teeth irregular, 0.5–1 mm wide; cupuliform glands 1–3 pairs, crowded at the base of the blade, sessile or slightly stalked; flowers tending to be clustered in small cymules near the tips of the panicle-branches; bracts leaflike, greatly reduced; sepals connate at base and subpersistent, densely stellate-pubescent without or with additional few or many long hairs up to 0.7 mm long; ovary and fruit, including spines, densely short stellate-pubescent, appearing gray or canescent; spines rigid, subulate, 1.5–3 (–4) mm long including the conic base.

Seaward-facing slopes and ravines, in barranca-forest with *Magnolia*, *Fraxinus*, *Prunus*, *Cornus*, and *Garrya*, or in drier and more disturbed situations with *Prunus*, *Fraxinus*, *Trema*, *Inga*, *Dendropanax*, *Ficus*, where it is locally abundant in several places, 1200–1500 m, flowering October to March.

JALISCO: Below the pass to Talpa de Allende, 10–12 km above La Cuesta, tropical subdeciduous forest in ravines, elev. 1400 m, fruiting and almost past flower 30 March 1965, *McVaugh 23363* (Holotype, MICH).

Additional specimens examined: JALISCO: Near the type-locality, probably not the same individual plants collected, in young flower 16 October 1960, *McVaugh 20312* (MICH); in flower and immature fruit 22 November 1960, *McVaugh 21302* (MICH); San Sebastián, trail to El Ranchito, *Mexia 1444* (MICH); 15–30 km N of Mascota, road to San Sebastián, *Anderson & Anderson 5980* (MICH).

The two collections from the Mascota-San Sebastián area differ from the others in having the leaves somewhat more broadly ovate, and in the calyx, which is densely long-pilose in Mrs. Mexia's collection and somewhat less densely so in Anderson's collection. The material from Talpa is essentially without long hairs on the calyx. In Ko Ko Lay's revision, *Mexia 1444* was referred to *Triumfetta speciosa* Seem., a similarly large-flowered but otherwise quite different species that ranges from Veracruz and Chiapas to Panama.

We suppose that *T. indurata* is rather closely related to the newly described *T. gonophora*, and that any seemingly close relationship with *T. speciosa* is a specious one because of the considerable difference between the fruits of the two species.

***Triumfetta medusae* W. W. Thomas & McVaugh, sp. nov.**

Fig. 1, o–w.

Frutex gracilis, arcuatus, 0.7–1 m altus, conspicue hirsutus pilis simplicibus 2–5 mm longis; folia ovata vel interdum trilobata, supra pilis longissimis exceptis glabra, subtus venis majoribus pilis obsita, superficie stellato-pubescentia, stellis 2–7-radiatis usque ad 1 mm diametro; laminae basi rotundatae vel cordatae, apice longe acuminatae vel subcaudatae, marginibus ciliatis argute serratis; venatio palmata, venis majoribus plerumque 5; petioli hirsuti 2–5 cm longi, superiores breviores; stipulae subpersistentes lanceolatae vel basi inaequaliter obliquae, ciliatae, 7–10 mm longae; inflorescentiae ramos terminantes, 5–20-florae, cymis pro maxima parte brevipedunculatis lateralibus ad modum racemi dispositis; pedicelli 1–2 mm longi; gemma anthesis initio anguste obovoidea vel pyriformis, 7–9 mm longa; sepala oblongo-linearum, cucullata, 1–1.2 cm longa, 1.6–1.9 mm lata, appendicibus subapicalibus 5–6.5 mm longis filiformibus; petala sublinearum 6–6.5 mm longa, 1 mm lata, basi pubescentia, ciliata; gonophorum perbreve, vix 0.3 mm longum, 1–1.5 mm latum, glandulis subquadratis; urceolus conspicuus, vix lobatus, ciliatus; stamina 17–22, glabra, conspicua, filamentis 7.5–8 mm longis, applanatis 0.5 mm latis; antherae 1.3–1.7 mm longae; styli 1.5 cm longi; ovarium orbiculare 1 mm diametro, uncinato-spinulosum; fructus orbicularis, 5-locularis, corpore 6–7 mm diametro sparce stellato, spinis 100–130 subulatis 3–4.5 mm longis, retrorse hispidis, spinulis inflexis, arcuatis.

Branches up to 1 cm in diameter or more, arising from a heavy rootstock; filaments conspicuous, yellow, the small yellow petals and the herbaceous or reddish-green calyx not showy; stems sometimes reddish; leaves 5–10 cm long, 3–7 cm wide, 1.3–2 times as long as wide; marginal teeth 0.7–2 mm wide, often large and small alternating, the basal ones neither much enlarged nor conspicuously glandular; lateral branches of the raceme-like axes mostly less than 1 cm long, the flowers sessile in clusters of about 5 or fewer; bracts leaflike, mostly lanceolate, 1–5 cm long; sepals at anthesis soon separating to the base, spreading or reflexed.

Known only from the Pacific lowlands, on rocky slopes near the ocean or in hillside oak-savannah associations, from sea-level to an elevation of 200 m, collected in flower 28–29 October, and in old fruit 7 March.

NAYARIT: precipitous hills in oak-savannah zone 11 km by road E of Las Varas toward Compostela, 28–29 October 1971, *Dieterle 3969* (Holotype, MICH).

Additional specimen examined: JALISCO: On Bahía de Banderas 9–12 km [S] by road from Puerto Vallarta, 7 March 1970, *Anderson & Anderson 6024* (MICH).

This species is so different from any other Mexican representative of the genus that its relationships are completely in doubt. It is immediately recognizable by the presence of long straight simple hairs in abundance on most parts of the plant, and by the unusually long sepal-appendages. Similarly long appendages are known in two other species, *T. purpusii* Standl. and *T. falcifera* Rose, neither of which resembles *T. medusae* in other ways. The epithet *medusae* is in reference to the cluster of appendages, variously curved, contorted and intertangled, that crowns each flower-bud.